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ABSTRACT

This paper discusses the comparative philosophical tenets and practices of Germany's Waldorf and state schools with regard to the creativity thinking ability of students. Waldorf schools, developed some 70 years ago, are based on the philosophy of creative idealism known as anthroposophy. A study of 1165 third through sixth grade children from Germany, Scotland, and England compared Waldorf and public schools. Students took the Torrence Test of Creative Thinking Ability, which includes verbal and figural components. The test is intended to measure: (1) fluency, the number of ideas produced; (2) flexibility, the different categories of ideas produced; (3) originality, the unusualness of an idea; and (4) elaboration, the development of an idea. Results showed that cross-culturally, Waldorf students obtained significantly higher creativity scores than their public school counterparts. In the figural part of the test, Waldorf student pictures showed greater technique, quality, and maturity. The findings may be attributable to the maturational readiness and nurturing aspects of the Waldorf schools, and the program's discouragement of student exposure to television and radio. Waldorf education also tends to foster a positive school climate and reduce faculty and student stress. Contains 30 references. (SG)

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CREATIVITY AND WALDORF EDUCATION: A STUDY

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CREATIVITY AND WALDORF EDUCATION: A STUDY

Earl J. Ogletree

The first Waldorf School was founded in Stuttgart, Germany in 1919 by Rudolf Steiner (1861-1925). In spite of the Waldorf movement's 70 years of existence, little data have been gathered on the effectiveness of its teaching methods; the organizational structure of its schools, or the achievement of Waldorf students. One reason is that competition, academic comparisons of students and classes, and standardized testing (except for the mandatory State external examinations--Advanced Level in England and the abitur in Germany and the ACT and SAT in U.S.--taken by Waldorf graduates who wish to enter a university), are foreign to the basic principles and practices of Waldorf education. Except for publications by Rudolf Steiner and Waldorf teachers and a half a dozen doctoral dissertations on the founder and the movement in the last decades, and an insignificant number articles by authors outside the Waldorf movement, their is a lack of comparative quantitative research on the system.

An international quantitative study was conducted on the Waldorf Schools in 1966 by the writer. The study entitled, "A Cross-Cultural Exploratory Study of the Creativeness of Steiner and State School Pupils in England, Scotland and Germany," has no predecessor nor successor to date.[1] To the researcher's knowledge, it is the only major international study on the creativity of Waldorf students. This paper will discuss the comparative philosophical tenets and practices of the Waldorf and state schools on the creativity thinking ability of their respective students.

The disparate educational practices in the Waldorf and state schools are influenced by their differing philosophies. The basic tenets of their respective philosophies and the subsequent educational implications will be described even though one is aware of the risk that one runs in labeling a particular educational system. Some generalizations, however, can be made if one keeps in mind that they are subject to the limitations of all principles.

Waldorf and State School Philosophies

The philosophy of a school determines its objectives, values and the type of education offered. In particular, it influences the curriculum, the methods of teaching, the role of the teacher, the view of the learner, and the quality of education. The Waldorf Schools are based on the philosophy of critical idealism, known as anthroposophy. The state or public schools were identified as natural or scientific realist institutions.

Idealism, is a cooperative art; i.e., it is a process in which the teacher "...cooperates with nature, assisting it (the development of watchful attention and timely prodding."[2] The

educational process includes the "gradual unfolding of a preexistent set of possibilities..." nature in movement already --striving, reaching, developing toward a new fulfillment of life purpose. The task of the Waldorf teacher is to help the child to adjust to the spiritual and material facts of its being and its earthly existence, so as to make the richest use of them. Huebner states that the goal of Waldorf education is to,

> ...liberate the spiritual essence of the child, to remove all obstacles and hindrances, and to make possible the full child's talents for later services in behalf of humanity.[3]

Realism, on the other hand, is an operative art. The realist is involved in the process of producing something...,"something which nature cannot produce itself." Education is the gradual acquisition of information, understandings, facts, attitudes, values and skills applied by teachers and other adults which the individual acquires in the course of growing up. The objective is to assist the child to learn and adjust to the culture and society in which he will live. It is a molding process "to become a tolerant and well-adjusted person in harmony with his physical and cultural environment." Or as Kneller explains, the purpose of a realist education is that...

> since the realist's view of the world exists independently of man, is governed by laws over which we have little control, the school should transmit a central core of subject matter that will acquaint the pupil with the world around him.[4]

The divergent goals of the idealist and realist philosophical schools of thought are congruent with their view of reality and how we know reality. Idealism maintains that reality is basically spiritual rather than physical. The physical world is a manifestation of the spiritual. For example, everything physical we see on earth is a product of an idea, whether the idea is expressed through man or comes from its primary source -- the spiritual world. Therefore, man, animals, plants, etc., were and are ultimately products of the workings of the spiritual world. The physical world is temporal--maya; whereas the spiritual world is permanent and real, possessing meaning and purpose.

On the other hand, the realist holds the physical world to be a greater reality than the spiritual world. The physical can be known directly via the five or six senses. It is permanent and enduring. The material world is ultimate reality and explainable by natural scientific laws. The things in the environment (trees, cities, animals, etc.) exist in and of themselves, independent of the mind.

The idealist views the child as a spiritual being who has a destiny to fulfill in accordance with his spiritual nature. The child, therefore, brings with him inherent talents and capabilities. Realists argue that the human being is a biological-social being, born with few or no inherent individual talents and capacities. They maintain that an individual's

abilities are determined by the impact of the physical-social environment on his genetic makeup.

These divergent philosophies have definite implications for the role of the teacher and the methods of teaching. Since the child has inherent talents and capacities, according to the idealist, the role of teachers is to develop these potentialities. Their task is to help draw or "wring" out that which is latent in the child, rather than to pour in knowledge or to force learning. An integral part of this learning process is the personality and character of the teacher, whose humanity must be worthy of emulation. The idealist teacher is expected to embody as fully as possible the finest characteristics of mankind, providing a role model for the children. The idealist teacher is a "gardener of the child's soul," a cultivator of a compatible learning environment. Education is a process, a developmental process in which certain subjects are introduced at specific stages of intellectual and personality development and taught in a specfic manner (actively and pictorially) to support and enhance the natural psycho-physical developmental of the children. Steiner stated that "the teacher cannot mold the child's nature; that is entirely a matter of self-development."[5] Barnes, former faculty head of a Waldorf School, adds:

> Many schools today are in a hurry to train young children and boast of the feats their five or six year olds can perform. There seems to be little sense to this race. Often it dwarfs significant aspects of the child; too often it prohibits growth. Steiner would have a child simmer in his own juices awhile, develop strength for a lifetime rather than exploit and deplete them foolishly.[6]

In contrast, the realist teacher views himself as a purveyor of knowledge and facts about the culture and the world. It is the student's responsibility to master these elements of knowledge that have stood the test of time. The curricular emphasis is on the mastery of subject-matter content, an end in itself. To the idealist the curriculum is a means to an end, the children's development. The curriculum of the realist school is largely determined by the needs of the culture, society and tradition. Whereas, the Waldorf curriculum is developed out of the psychophysical and social needs of the child. The realist believes that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development."[7] Emphasis is placed on the intellectual/academic rather than on the total development of the child. This was particularly characteristic of the state schools in England, Scotland, and Germany sampled in this study. Some characteristic commentaries by European educators such as Bereday, King and McKay agreed that publicly-supported schools in England, Scotland and Germany are dominated by intellectuality and the curriculum, with obvious variations and exceptions, were almost uniformly academically oriented.[8], [9], [10]

In all three countries the tripartite educational systems were dominated by an external examination system that select children

at an early age (11+ in England and Scotland, and ages 10-11 years in Germany), who are academically able or intellectually qualified for a secondary education leading to the university. Approximately 20-25 percent are admitted to the university preparatory secondary schools (grammar), and the other eighty-plus percent go on to terminating secondary schools, leading to non-professional or trade occupations. Although, European state schools have partially adopted a modified version of the American comprehensive high school and school-based management in English schools since the 1960's, it is beyond the scope of this paper to go into detail on the changes in state schools of the three countries, subsequent to this study. Apart from the number of efforts at educational reform (implementation of the comprehensive schools) in the three countries, a tripartite system of education, based on a natural realist philosophy in which examinations are an integral part of the educational process which still exists. For the purposes of this study it was assumed, based on the above factors of homogeneity of state school educational practices within a country, that the state schools were more alike than they were different. A single state school was an accurate reflection of their respective national school systems.

By their traditional nature the state schools are committed to a curriculum that is intellectually-based, formal and academically oriented, dictated by an external examination system. However, this is not true of the Waldorf Schools. All Waldorf Schools are with the few exceptions of newly founded schools, include grades kindergarten through twelve (thirteen in Germany). The inclusive Waldorf system had certain advantages--freedom from the pressures of external examinations, particularly the intermediate examinations at ages 11-12 and at ages 15-16, academic competiveness, and ability grouping/tracking (streaming in England), prevalent in the early grades in the state schools. However, the Waldorf Schools are not totally free of external state examinations. In the last years of secondary schooling, time is set aside for seniors to prepare for the university admission examinations (G.C.E.-Advanced Level in England and Scotland and the Abitur in Germany). Waldorf students are not only grouped by age level, but the teacher remains with the same students, grades one-eight. He/she becomes a surrogate parent to her charges. Consequently, there is no need for external or class examinations. Cooperation is encouraged, competiveness avoided.

This freedom allows the Waldorf teachers to implement Steiner's curriculum, unfettered by state examinations. Kerr, who contrasted the English state schools with the Waldorf Schools, characterized the latter as unorthodoxed.

> The Steiner school believes in developing the emotional side of children first, and the intellectual aptitudes later, without forcing them...(and) aim at developing happiness rather than achievement.[11]

Steiner explained,

> ...at the Waldorf School, value is placed upon artistic rather than intellectual training at the beginning of the

> school life. The teaching is first pictorial, nonintellectual; the relation of the teacher to the child is pervaded by a musical quality, and by such methods we achieve the degree of intellectual development the child needs.[12]

The Waldorf or idealist school has a child-centered curriculum. The approach is not only nonintellectual, but holistic. The task of the Waldorf teacher is to help the child to realize his latent capacities in each of the domains--psychomotor, emotional and cognitive. The Waldorf curriculum, which is sequenced in accordance with the child's unfolding stages of development, provides the child with competencies and skills in art, music, crafts, languages, speech, geometry and the academic areas. Essentially, every subject taught in the Waldorf Schools is pervaded by artistic activity. Every subject area, including drawing, painting, crafts, and music, is taught as a developmental skill, not as an isolated subject. It is held that every child can find success:

> In view of the theory that the potentialities and talents of children vary greatly, the curriculum is unusually rich. In addition to the regular subjects there are gardening, surveying, mechanics, bookbinding, weaving, spinning, etc. With such a variety of offerings, every child will find something of interest and something in which he may excel. The generally accepted distinction between gifted and nongifted thus tends to vanish.[13] Every normal human being is gifted in some area.

Teaching methods and timing of presentations are as important as the content. Images, rhythms, movements and emotional involvement are the heart of each lesson. Although Waldorf children may not perform as well on conventional worksheets and tests as compared to their state school peers, they enjoy the activities and subjects they learn. It is the engendered emotional and physical participation and energy that allows Waldorf students to experience material that they otherwise may not be able to learn conceptually. A pedagogical principle in Waldorf education is to "experience knowledge" prior to conceptualization. In summary, Waldorf (idealist) teachers attempt to fit the curriculum to the developmental needs of the child, whereas, realist teachers attempt to fit the child into a curriculum determined, in the main, by tradition and the needs of society.

Creativity

A great deal of the research on creativity has been devoted to factors that influence creativity development. In the main, the researchers have found that an enriched-stimulating, as opposed to a deprived-unstimulating environment, and an active-exploratory versus a passive-instructional teaching approach, and a permissive as opposed to an authoritarian learning atmosphere positively affects creativity development.

Much of the research indicated that the idealist educational approach is the more propitious method for the development of creativity. Torrance. a pioneer in creativity research,

concluded that too much pressure on children to learn academic subjects tends to prematurely stifle fantasy. He also set forth five principles that teachers should follow to develop creativity: 1) treat children's questions and ideas with respect; 2) treat unusual ideas with respect; 3) show children their ideas have value; 4) provide opportunities for self initiated learning; and 5) provide periods of nonevaluated practice.[14] Additional recent research has shown that forced learning can affect not only the child's learning potential but his emotional and social stability.[15] Steiner felt very strongly about the influences of an intellectualistic education on the creative potential of children. He argued that teaching in a purely abstract/conceptual form should be delayed as long as possible, because intellectual "forcing (deadens) and prematurely burns up the child's native imagination. If we demand intellectual concepts and responses too soon the child is brought to false maturity."[16] Recent findings by Elkind indicated that pressuring children to learn before they are ready causes stress, and a feeling of lack of control over one's life, "a learned helplessness."[17]

Torrance, who attempted to include the Waldorf Schools in one of his earlier studies, but failed to obtain the necessary cooperation, hypothesized that Waldorf pupils would not have shown the usual regression in creativity at ages nine-ten years; It had been my idea at that time that we should not find in these schools (Waldorf) the discontinuity in (creativity) development that we find so commonly in most schools at the beginning of the fourth grade."[18]

Procedures of the Study

Population/Sample

The study comprised a total sample of 1165 third -sixth grade European children, which included 479 English, 193 Scottish and 493 German pupils and 557 boys and 608 girls. The sample was drawn from six Waldorf Schools and six state schools of which 499 were Waldorf pupils and 666 state school pupils. Two participating Waldorf Schools were selected in Germany out of a total population of 27 Waldorf Schools, three out of five in England and the single Steiner School in Scotland. Representative state schools were selected in each of the cities where a Steiner school was selected to obtain a comparative sample. The schools (Waldorf and state) were located in Munich and Stuttgart, Germany; Edinburgh, Scotland; and Gloucester, Ilkeston and Stourbridge, England. (The investigator could not get permission from U.S. Waldorf Schools to conduct the study. Similar resistance was met from the respective schools in Europe. It was only through friends associated with the schools that permission was secured.)

The Waldorf and state school pupils were matched on the basis of their socioeconomic status by their location and by their responses on a modified version of the "Registrar General's Occupational Classification Scheme" to categorize the pupils

according to social class by occupation of parents. (Social class classification by occupation between cultures is not the sole determinant, it is however, the major criterion used by most social science research.) Social class status was the only means available to pair the samples in that I.Q. and standardized achievement test scores were not available in the Waldorf Schools nor from the state schools. The sample was administered the Torrance Test of Creativity Thinking Ability orally in their native language. The tests were uniformly modified in terms of time allotment for each task and instructions given the pupils. The results were analyzed by school systems, country, social class, age, sex and grade level using the one-and two-way analysis of variance and the F and "t" tests to determine the statistical significance (.05) of the results.

Definition of Creativity and Instrument

For the purpose of this study, the general definition of creativity is:

> ...the capacity of an individual to produce compositions, products or ideas related to particular tasks which are essentially new or novel, previously known or unknown to the producer or creativity is a process, the contribution of new ideas a different viewpoint; a new way of looking at a problem, situation or event, where the freedom of the individual is the basis of expression".[19]

Creativity is closely associated with divergent-open response-type thinking, whereas convergent thinking is associated with intellectual reasoning or close response-type thinking. The research or operational definition of creativity for this study is the scores on the Torrance Test of Creative Thinking Ability. The creativity test measure four elements of the creative thinking process: 1) fluency (the number of ideas produced, 2) flexibility (the different categories of ideas produced, 3) originality (the unusualness or the infrequency of an idea), 4) elaboration (embellishment and development of an idea).

It consists of two parts--a verbal section which requires a written response and a figural section that requires drawing or figure completion responses. The verbal section consists of three activities-- Ask and Guess task (given a picture of people in action--running--children are to write down questions, guess causes and guess consequences about what is occurring in the picture). Product Improvement task (given a picture of a toy animal, children are expected to list a number of ways they can change the toy and improve it). And the Unusual Uses tasks (given a number of many sized and shaped boxes, children are expected to list the number of creative ways they can use and make things from the boxes).

The figural section also included three activities-- Picture Construction task (children were asked to draw the most interesting and creative picture, which included a "banana-shaped" paste-on as an integral part of their drawing). Picture Completion task (children are given incomplete figures which they complete as a finished drawing). Circles task (children are

given a series of circles and are asked to make objects or pictures from them).

Results

The findings showed that cross-culturally, Waldorf School pupils obtained significantly higher (.01 level) creativity scores than their state school peers. This held true when analyzed by social classes. The only exception was that lower-socioeconomic state school pupils scored higher on verbal originality than their Waldorf peers, but insignificantly. The results were probably influenced by differences in sample sizes. There were only 21 lower socioeconomic state school pupils.

When the data were examined according to country, Waldorf pupils also performed better on all tasks of the creativity test. However, they only obtained significantly higher scores at the .05 level on the total verbal and figural (drawing) sections and on the grand total creativity score. The findings showed, however, that Scottish and German Waldorf pupils obtained higher overall creativity scores than their respective state school peers and also higher scores than did English Waldorf pupils.

Unlike the Scottish and German Waldorf school pupils, the English Waldorf pupils did not obtain significantly higher verbal fluency, flexibility and originality scores than their state school peers (i.e., the differences were probably the result of chance). On the drawing tasks, however, they did obtain significantly higher scores. The reason for this discrepancy is that English primary schools had a reputation for being progressive and innovative and not as traditional as their Scottish and German counterparts.

The general trend of Waldorf School pupils' higher performance to that of state school pupils was unaffected, for the most part, by the variables of grade level and age; but eight-year-old state school pupils scored higher on the verbal tasks than did their Waldorf peers, but not significantly. It may have been the result of the delayed reading program in the Waldorf Schools. When the data were examined by gender, Waldorf boys and girls prevailed over their respective state school peers significantly (.05) on all creativity tasks.

The cross-cultural data also revealed no significant drops or decrements in creative development at age nine to ten years in either school system. Torrance felt that the new demands and changes in habits that a particular culture produces at certain ages may disrupt the child's learning pattern. That is, the child compromises to accommodate social requests and to accept authority outside his home. Steiner believed the change is the result of social maturation; the child is less dependent on and views his teacher more objectively. In this study, an increase in age and grade level evidenced an accompanying increase in creativity on all creativity tasks, but not significantly.

Additional data were collected to determine if the number of

years spent in a Waldorf school significantly affected enrollees' creativity. Data were tabulated for pupils who began their schooling career at the Waldorf school in the first, second and third grades. Analyses showed that those who entered at the third grade level scored higher than those who entered at the second grade level; and the second grade entrants obtained higher scores than those pupils who began their Waldorf schooling in the first grade. Although the difference in creativity between grade levels was not statistically significant, it may indicate that later entrants were more test sophisticated, having been exposed to a more intellectual, academic and test-oriented program in the state or private schools from which they transferred. Later Waldorf enrollees also had better reading skills, a requirement on the verbal section of the Torrance test. Several Waldorf teachers felt those Waldorf pupils, who had attended a non-Waldorf school in the early years, seemed to get on better, in some circumstances, than pupils who began their educational career at a Waldorf School.

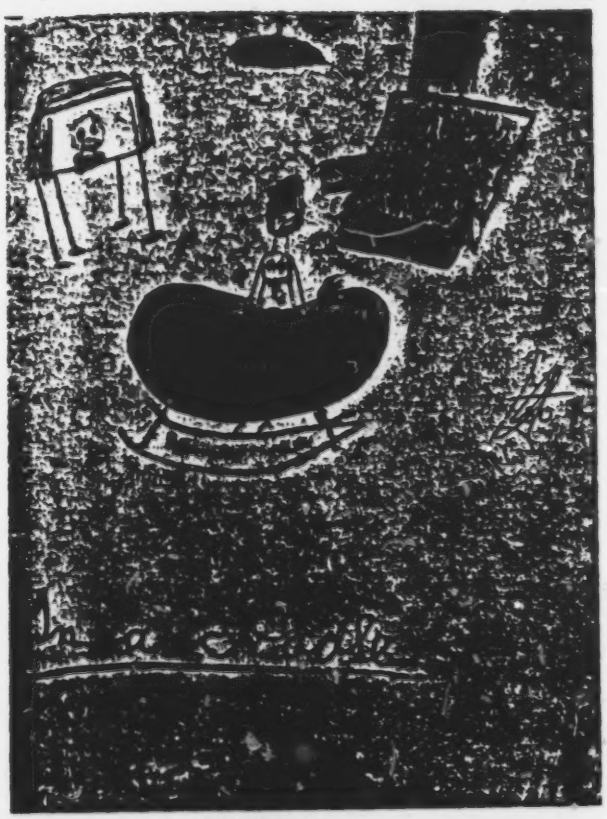
Qualitative data were also collected based on the analysis the students' drawings. The figural portion of the test involved the subjects' drawing "the most interesting picture they could think of" that included a banana-shaped paste-on as an integral part of their creation. They were given 15 minutes to complete the picture. Pictures 1-3 were produced by Scottish fifth and sixth grade students and pictures 4-6 by Waldorf students. (See pages 10 & 11.)

A comparative examination of a random sampling of drawings indicate a difference in technique, quality, and maturity. The Waldorf drawings appear to be more mature in terms of skill and technique--blending, balance and selection of color. In contrast, the state school drawings appear to be less sophisticated in these attributes, lacking artistic technique and developmental skill. They could be the product of lower grade level students.

Another point is the state school drawings (1-3) are first outlined and then filled in with color or pencil, whereas the Waldorf drawings (4-5) are not. Instead, form and line are developed by the blending of colors with one another or shading with pencil. Steiner believed outlining is an abstraction; it doesn't exist in nature. In a sense, outlining, according to Steiner, is an intellectual representation, a concept, divorced from reality. (As indicated, Waldorf teachers convey academic content through pictorial images, stories and artistic activities, not by intellectual concepts and abstractions. Art is not only the teaching media, but is taught as a continuous developmental skill, as the academic subjects.) Instead of outlining, Waldorf children are taught a shading technique, as depicted in the pictures. This appears to make the drawings more lively, natural, freer and creative in their artistic expression than the state school drawings. Another difference is the completeness (filling out, leaving no empty space) of the drawings, particularly pictures 5 and 6. Students are encouraged to

Picture 1

Picture 2



Picture 3

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Picture 4

Picture 5

Picture 6

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complete what they begin. The qualitative analysis suggests that a schools' philosophy can influence the quality of art and creativity.

Related findings

Additional findings showed: 1) upper and middle class students had significantly higher creativity scores than their lower socioeconomic peers, 2) culture had little interactional influence, and 3) girls did significantly (.05) better on the test than boys.

Summary

The findings of the study indicate that Waldorf students were more creative, as defined by the basic criteria of the creativity test, than their public school peers. There was a great deal of commentary, particularly from Waldorf teachers, about the validity of the Torrance test.* The researcher attempted to establish concurrent/predictive validity by asking each participating teacher to select their most creative pupils. Teachers' judgment was based upon the criteria of the creativity test and their own opinion. Analysis showed that the 302 pupils nominated by their teachers as being the most creative scored significantly higher on the creativity test (.05) than their 836 nonselected peers. Although the data were not comparatively examined according to school system, the findings, nevertheless, indicated that both Waldorf and state school teachers' nomination of creative pupils related significantly to their performance on the Torrance Test of Creative Thinkng Ability.

Discussion

Although the results have many of the limitations of an expost-facto study, nevertheless, certain generalizations can be made. It appears that the Waldorf students' significantly better performance on the creativity measures is the result of the many factors that constitute a Waldorf education, which differentiates it from the educational practices in the state schools. Probably the most important elements are the maturational-readiness and nurturing curriculum of the Waldorf Schools, including the continuous teacher, grades one-eight; de-emphasis on academic performance in the early grades; use of art as the medium of instruction; teaching methods, curriculum and organization of the program. Another factor is the Waldorf Schools implore parents to forbid their children from watching TV and listening to radios and other electronic media. Many European Waldorf Schools enforce a no TV policy. Their belief is that it has a deleterious effect on children's cognitive development appears to be supported by Healy in Endangered Minds, Why Our Children Don't Think.[10] Healy contended that the frequent visual and auditory changes provided by television keep the brain "unnaturally alert--but a responding level rather than at a thinking level."[11] A Canadian investigation documented that both children and adults exposed to television suffered a 20 percent decrease in creativity. The Canadian researchers studied a small British Columbian town in the Rocky Mountains just before it got television for the first time and again two years later. The 20

percent loss in creativity appears to correspond to the 20 percent decline in average SAT scores in U.S. in the past 20 or 25 years.[22] The degree to which the no TV policy influenced Waldorf students' creativity scores depends on the level of parent/student cooperation and the schools to ability to enforce the policy. Waldorf teachers said they could readily identify habitual TV viewers.

As indicated, Steiner's instructional system attempts to meet the development needs of children rather than mold the child into a predetermined program. To explain, Steiner developed a coherent theory of learning which includes a fourfold concept of man--physical body, etheric body (made up of vital or energy forces), astral body (soul or psyche), and the ego. It is the developmental-unfoldment of these bodies, particularly, the etheric body (which propagates growth, regenerates cells, maintains health and is the basis of cognitive development) and the integration of the ego at different ages that determine the subjects in the curriculum, their timing and method of presentation. (Steiner's complex, esoteric, spiritually-based, theory of child development is an additional, if not the primary, reason that little is known or understood about Waldorf education.)

Although Steiner stages of development correspond somewhat to Piaget's stages of cognitive development, they include not only the total child--thinking, feeling and willing but a therapeutic element as well. This therapeutic aspect of Waldorf education deals with the physical, psychological and medical needs of children. Children with developmental/social/medical difficulties are discussed at the weekly faculty meetings. A physician is associated with each school; eurythmy (an art of movement) is used to teach reading, speech and music and for therapeutic purposes, known as curative eurythmy; and specific pedagogical techniques are employed to remedy these difficulties. One method is to group children according to their temperament (choleric, phlegmatic, sanguinic, and melancholic) to balance the extremes of their personality. More serious psychological and academic problems are rectified by balancing the above four members (ego, astral, etheric and physical bodies) via curricular and teaching techniques and medically, if needed. Experienced Waldorf teachers are not only expected to recognize when a child has a developmental/learning problem, but know how to remediate it.[23] Steiner believed that Waldorf educators should have a detailed and working knowledge of these four bodies, including the formative or growth forces (the foundation of growth and cognition) to help the children in the same way a computer technician needs detailed knowledge of the working of a computer to repair it. He said:

> So for the art of education it is the knowledge of members (ego, astral, etheric, and physical) of man's being and of their several development which is important. We must know on what part of the human being we have especially to work at a certain age and how we can work upon it in the proper way.[24]

Brief examples of remediation techniques for balancing each of the four members are:

> If the ego is weak and does not enter fully into the rest of the organization, we have children who are dreamers,... easily swayed by outside influences...and unable to deal with life...speech that lean toward the musical that arouses rhythm and feelings is helpful. When the ego is too strong and enters to deeply into the organization, the art of speech...(that) concentrates on sense and meaning of what is spoken...and drawing forms which are usually grasped in thought...prevents the ego from being too absorbed in the physical organization.[25]

If the astral body (soul) is weak and does not enter properly into the organization, the child lacks ability to concentration and remember and is easily distracted, concentrated drawing and writing exercises with emphasis on exactness and neatness is required. If the astral body is too incarnated in the body, painting and color relationships and music helps to loosen the astral body and lift the child out of his melancholy.

If the etheric body (energy forces) are too weak, children exhibit tiredness and feel overwhelmed,..."modelling in all its forms is the art" (wax, clay, plasticine, wood, paper, etc.) that strengthens and firms the etheric body. If the etheric body is too strong, the children are slow and learning difficult. The remedy is again modelling of forms (pyramids, cubes, spheres, etc.) that require conceptual, abstract thinking, constantly keeping their thoughts on the forms.

> When the difficulty has penetrated as far as the physical body, it becomes a medical matter. The school physician is consulted.[26]

Some schools have a remediation team, consisting of a physician, curative eurythmist,* speech therapist and art therapist to help students.

Steiner expected teachers to know as much about medicine as they do about their own profession.[27] As indicated health matters are discussed at weekly faculty meetings and referred to the school physician and the parents, of course. Further explication of Steiner's theory of child development and therapy is beyond the scope of this paper. But it does give one an idea of the complexity of Steiner's theory and the therapeutic and caring nature of Waldorf education.

Educational practices appear to closely follow the Waldorf Schools philosophical goals and psychological theories so that "the part reflects the organic whole." The results suggest a school with an educational program based on maturational-readiness of children would have a greater opportunity of fostering creativeness that one that does not. Research indicates that a non-pressured, non-stressful educational milieu has a positive effect on creative development.[28] Since their inception, the Waldorf Schools have been self-governed by a

collective body of teachers, called the college of teachers or faculty council, not by an outside appointed administrator. They organize their "lines of work themselves in the classroom to general considerations needed to manage a school."[49] Coupled with their commitment to Steiner's Anthroposphical philosophy, their collaborative administrator/teacher responsibilities to Waldorf education and the students would appear to foster a positive school climate and lessen faculty and student stress. Also the continuous first-eighth grade teacher, who becomes a surrogate parent, provides a family-type, non-threatening learning atmosphere for students. As indicated there is no formal testing; nor is there a need for it. These factors would appear to provide a propitious environment for creative development.

Although creativity tests may be suspect as to whether or not they measure creative ability, they do indicate the ability to generate and elaborate ideas.** As with any test the results are influenced by maturity, experience and socioeconomic status. It would appear that those students who are exposed to a broad, multi-subject developmentally, integrated curriculum with equal emphasis on the arts and academic areas should perform better on creativity tests than students educated in a strictly academic environment. The educational process appears to be as important as what is taught, the "nurturing" as opposed to the "molding" process may be more conducive to developing a more fully educated and well rounded individual. The findings of the study suggest that open-ended (creative) thinking is nurtured and influenced by the philosophical tenets of the school one attends. One could also argue that only the higher socio-economic, better prepared and more gifted students attend Waldorf Schools. This may true in the U.S. and somewhat in Great Britain, but not in Germany, where both state and private schools are equally funded by the government. Also in the latter two countries, the curriculum and what is taught is influenced by state external examinations and competition for a limited number of university places.

**Validity and Reliability of the Creativity Test

The validity of the Torrance test to measure creative thinking is an issue. The consensus is that they do not measure a kind of universal creative thinking ability. But it is held that the tests do measure certain intellectual processes as well as non-intellectual characteristics, divergent thinking, which standard IQ tests do not measure. However, Torrance believed

> ...a high degree of these abilities (fluency, flexibility, originality and elaboration) does not guarantee that the possessor will behave in a highly creative manner. A high level of these abilities, however, increases a person's chances of behaving creatively.[30]

Since the Torrance Test of Creative Thinking appeared to measure an intellectual mode of divergent thinking--open-ended thinking--not considered by standardized tests of intelligence, since their validity and reliability were sufficiently high, these factors justified the use the creativity test in this investigation.

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